CLAIMS

What is claimed is:

1. A gypsum board, comprising:
    a. a gypsum layer having a first face and a second face and comprising set gypsum; and
    b. first and second facers affixed to said first and second faces, said first facer being a fibrous mat comprising a non-woven web bonded together with a resinous binder, and said web being composed of chopped continuous glass fibers having an average fiber diameter ranging from about 9.5 to 12.5 μm.
2. A gypsum board as recited by claim 1, wherein said chopped continuous glass fibers are composed of at least one member selected from the group consisting of E glass, C glass, T glass, sodium borosilicate glass, and mixtures thereof.
3. A gypsum board as recited by claim 1, wherein said chopped continuous glass fibers are composed of E glass.
4. A gypsum board as recited by claim 1, wherein at least about 90% by weight of said chopped continuous glass fibers have a diameter ranging between about 9.5 and 12.5 μm.
5. A gypsum board as recited by claim 1, wherein at least about 95% by weight of said chopped continuous glass fibers have a diameter ranging between about 9.5 and 12.5 μm..
6. A gypsum board as recited by claim 1, wherein at least about 97% by weight of said chopped continuous glass fibers have a diameter ranging between about 9.5 and 12.5 μm.
7. A gypsum board as recited by claim 1, wherein said chopped continuous glass fibers have an average fiber length ranging from about 6 to 12 mm.
8. A gypsum board as recited by claim 1, wherein at least a majority of said chopped continuous glass fibers have a fiber length ranging from about 6 to 18 mm.
9. A gypsum board as recited by claim 1, wherein said resinous binder is composed of at least one member selected from the group consisting of urea formaldehyde; conventional modified urea formaldehyde; acrylic resin; melamine resin; high nitrogen melamine resin; homopolymer and copolymer of polyacrylic acid having a molecular weight of less than

10,000; crosslinking acrylic copolymer; crosslinked vinyl chloride acrylate copolymer; and modified acrylic latex binder.

10. A gypsum board as recited by claim 1, wherein said resinous binder is composed of a modified acrylic latex binder.
11. A gypsum board as recited by claim 9, wherein said resinous binder further comprises a cross-linker in an amount ranging up to about 10 weight percent.
12. A gypsum board as recited by claim 11, wherein said cross linker is present in an amount ranging from about 2 to 5 weight percent.
13. A gypsum board as recited by claim 11, wherein said resinous binder comprises melamine formaldehyde.
14. A gypsum board as recited by claim 1, wherein said resinous binder has a glass transition temperature ranging from about 15 to 45°C.
15. A gypsum board as recited by claim 1, wherein said resinous binder further comprises at least one water repellant agent.
16. A gypsum board as recited by claim 1, wherein said fibrous mat further comprises effective amounts of fine particles of limestone, glass, clay, coloring pigments, biocide, fungicide, intumescent material, or mixtures thereof.
17. A gypsum board as recited by claim 1, wherein said fibrous mat has a basis weight ranging from about 0.6 to 2.2 pounds per 100 square feet.
18. A gypsum board as recited by claim 17, wherein said fibrous mat has a basis weight ranging from about 0.9 to 2.2 pounds per 100 square feet.
19. A gypsum board as recited by claim 18, wherein said fibrous mat has a basis weight of about 1.25 ± 0.2 pounds per 100 square feet.
20. A gypsum board as recited by claim 1, said second facer comprising kraft paper.
21. A gypsum board as recited by claim 1, said second facer comprising a fibrous mat.
22. A gypsum board as recited by claim 1, said second facer being a fibrous mat comprising a non-woven web bonded together with a resinous binder, and said web being composed of chopped continuous glass fibers having an average fiber diameter ranging from about 9.5 to 12.5 μm.
23. A gypsum board as recited by claim 1, wherein said gypsum core further comprises at least one water repellant agent.
24. A gypsum board as recited by claim 1, wherein said gypsum core further comprises reinforcing fiber.

25. A gypsum board as recited by claim 1, wherein said gypsum core further comprises a biocide.
26. A gypsum board as recited by claim 1, said board having flame resistance sufficient to pass the test of ASTM Method E84, Class 1.
27. In a gypsum board having a first face and a second face and a non-woven fibrous mat affixed to at least one of said faces, the improvement wherein said mat comprises a web bonded together with a resinous binder and comprising chopped continuous glass fibers having an average fiber diameter ranging from about 9.5 to 12.5 μm.
28. A process for manufacturing an article comprising a hydraulic set material layer having first and second faces, and first and second facers affixed thereto, at least said first facer comprising a non-woven, fibrous mat, the process comprising:
    a. providing said non-woven, fibrous mat having a fibrous web composed of chopped continuous glass fibers having an average fiber diameter ranging from about 9.5 to 12.5 μm bound together with a resinous binder;
    b. forming an aqueous slurry comprising at least one member selected from the group consisting of anhydrous calcium sulfate, calcium sulfate hemi-hydrate, and hydraulic setting cement;
    c. distributing the slurry to form a layer on said first facer;
    d. applying said second facer onto the top of said layer;
    e. separating the resultant laminate into individual articles; and
    f. drying the articles.
29. A fibrous mat comprising a non-woven web bonded together with a resinous binder, said web being composed of chopped continuous glass fibers having an average fiber diameter ranging from about 9.5 to 12.5 μm.
30. A fibrous mat as recited by claim 29, wherein at least about 90% by weight of said chopped continuous glass fibers have a diameter ranging between about 9.5 and 12.5 μm.
31. A fibrous mat as recited by claim 29, said mat having a permeability of at least about 300 cfm/ft^2 measured by the Frazier test.

32. A hydraulic set board, comprising:
    a. a hydraulic set material layer having a first and a second face; and

b. first and second facers affixed to said first and second faces, at least of said first facer being a fibrous mat comprising a non-woven web bonded together with a resinous binder, and said web being composed of chopped continuous glass fibers having an average fiber diameter ranging from about 9.5 to 12.5 μm.